

P-6.3 Explain pitch, loudness, and tonal quality in terms of wave characteristics that determine what is heard

Revised Taxonomy Levels 2.7 B Explain conceptual knowledge

In third grade, students

- ❖ Compare the pitch and volume of different sounds (3-5.6)
- ❖ Recognize the ways to change the volume of sounds (3-5.7)
- ❖ Explain how the vibration of an object affects pitch (3-5.8)

In physical science students

- ❖ Understand that changes in sound frequency as are perceived as changes in the pitch of the sound.

It is essential for students to

- ❖ Understand the qualitative and quantitative relationship between the intensity of a sound and the amplitude of the wave
- ❖ Understand the qualitative and quantitative relationship between the pitch of a sound and the frequency of the wave.
- ❖ Understand how tonal quality of a sound is determined by the frequency ratio of the waves comprising it

Assessment

The verb explain means that the major focus of assessment should be for students to “construct a cause and effect model”. In this case, assessments will ensure that students can model how the wave characteristics of frequency and amplitude affect the perception of sound and how the ratio of the frequencies of several sounds determine the quality of a sound. Because the indicator is written as conceptual knowledge, assessments should require that students understand the “interrelationships among the basic elements within a larger structure that enable them to function together.” In this case, assessments must show that students can construct a cause and effect statement relating how the frequency and amplitude of sound waves affect the human perception of sound.